

Claims

1. An isolated nucleic acid sequence encoding *Arthrobacter* hsp70 protein, or a fragment thereof.
2. An isolated hsp70 nucleic acid sequence according to claim 1 which is from the *Arthrobacter* strain deposited under accession number ATCC 55921.
3. An isolated nucleic acid sequence comprising the nucleic acid sequence of SEQ ID NO:1, or a fragment thereof, or a sequence having at least 85% homology thereto, or a sequence which under stringent conditions hybridizes with the sequence of SEQ ID NO:1.
4. A chimeric nucleic acid sequence comprising the isolated nucleic acid sequence of any of claims 1 to 3 fused in-frame to a heterologous coding sequence.
5. A chimeric nucleic acid sequence according to claim 4, wherein said heterologous coding sequence encodes an antigen from an animal pathogen.
6. A chimeric nucleic acid sequence according to claim 5, wherein said antigen is IPNV VP2 or VP3.
7. A DNA expression vector comprising the nucleic acid sequence of any of claims 1 to 6, wherein said nucleic acid sequence is operably linked to a transcriptional regulatory sequence.
8. A host cell transformed with the DNA expression vector of claim 7.
9. An isolated *Arthrobacter* hsp70 amino acid sequence, or a fragment thereof.
10. An isolated hsp70 amino acid sequence according to claim 9 which is from the *Arthrobacter* strain deposited under accession number ATCC 55921.

11. An isolated amino acid sequence comprising the amino acid sequence of SEQ ID NO:2, or an immunogenic fragment thereof; or the sequence from amino acid 162 to 365 thereof; or a sequence having at least 85% homology thereto; or a derivative thereof.
12. An amino acid sequence according to any of claims 9 to 11 which is covalently or non-covalently linked to a heterologous molecule to form a conjugate molecule.
13. An amino acid sequence according to claim 12 wherein said conjugate molecule is a fusion protein.
14. An amino acid sequence according to claim 12 or claim 13 wherein said heterologous molecule is selected from bacterial, viral, fungal, protozoan, nematode and tumour antigens.
15. An amino acid sequence according to claim 14 wherein said antigen is any of the following proteins from ISAV: nucleocapsid protein; hemagglutinin; polymerase; and segment 7 P4 and P5 proteins.
16. An isolated amino acid sequence encoded by the nucleic acid molecule of any of claims 1 to 6.
17. An isolated nucleic acid molecule encoding the isolated amino acid sequence of any of claims 9 to 15.
18. A vaccine composition comprising the nucleic acid molecule of any of claims 1 to 6, or the DNA expression vector of claim 7, or the amino acid sequence of any of claims 9 to 15, or an *Arthrobacter* cell extract enriched in hsp70, and a pharmaceutically acceptable carrier.
19. A vaccine composition according to claim 18 further comprising at least one heterologous antigen or a nucleic acid sequence encoding a heterologous antigen.
20. A kit comprising a vaccine composition according to claim 18 and a heterologous antigen or a nucleic acid sequence encoding a heterologous antigen, for separate, sequential or simultaneous administration.

21. Use of a nucleic acid sequence according to any of claims 1 to 3 or an amino acid sequence according to any of claims 9 to 11 as a vaccine adjuvant.
22. A method of adjuvanting a vaccine comprising mixing a vaccine antigen with an amino acid sequence according to any of claims 9 to 11.
23. An antibody raised against the amino acid sequence of any of claims 9 to 15.
24. Use of a nucleic acid sequence according to any of claims 1 to 6, or an amino acid sequence according to any of claims 9 to 15, as a medicament.
25. Use of a nucleic acid sequence according to any of claims 1 to 6, or a DNA expression vector according to claim 7, or an amino acid sequence according to any of claims 9 to 15, or an *Arthrobacter* cell extract enriched in hsp70, in the preparation of a medicament for the immunization of an animal against infectious disease.
26. Use according to claim 25 wherein said animal is a teleost fish.
27. Use according to claim 26 wherein said disease is Bacterial Kidney Disease (BKD) or Salmonid Rickettsial Septicaemia (SRS).
28. An isolated heat shock protein of approximately 67kDa measured by SDS-PAGE which is localized to the cell wall of *Arthrobacter* cells and has the N-terminal amino acid sequence: (M)SRAVG IDLGT TNSVV SVLE.
29. A DNA expression vector comprising the promoter sequence of SEQ ID NO:1, or a substantially homologous sequence, linked to a heterologous gene.
30. Use of a heat shock protein in the manufacture of a vaccine composition for prevention or treatment of infectious disease in fish.